

## **Killing them with Kindness**

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Old timers in the guppy hobby, as well as those who had them growing up many years ago and have re-entered the hobby recently; both can wistfully remember when guppies enjoyed much greater popularity. Guppies created a sensation a century ago and were called millions fish by the Germans due to how easily they were kept and multiplied. Fish keeping was low tech from then to at least the 1970's and the fish thrived. Gravel in guppy tanks was more popular in those days. Obviously, their beauty and small size, peaceful nature and the ease with which they were bred made them big winners in the aquarium hobby. In Chicago in the 70's and 80's when I was growing up there were dozens of pet stores that had multiple tanks of fancy guppies. Some carried a dozen or more varieties and the quality of fish then was high enough to shock many new to the hobby today if they could travel back in time and see them. Fancy guppies at that time were hardy fish, recommended to all beginning fish keepers. They were a joy to keep and rarely got sick in my experience. A lot of friends I had in those days growing up kept guppies in peaceful community tanks, even some with angelfish, and the guppies thrived. Back in those days, I did water changes and major tank cleaning once a year, since my mom hated water on the floors. I usually just added water to replace that lost by evaporation. I always had live plants in the tanks, and so did many others in those days. I think that was and remains a key to success-- the plants prevented ammonia spikes and nitrate build up and provided a margin of safety when mistakes in overfeeding were made. The fish just seemed to be happier as well with some live plants in the tanks. I also didn't realize it was important at the time, but aged tank water and the gunk in gravel contain infusoria that are both a food source for fry and a source of challenge to the immune system of the guppies.

One crushing blow to the guppy hobby that happened after I left guppies to go to college was the accidental importation of viruses that wreaked havoc with domestic show fish. We may never know exactly when the viruses first appeared here, but I saw somewhere on the net an account (and I apologize that I can't recall where that was) that the virus arrived here from Asian imports. Tom Allen told me a virus appeared soon after the 1998 Milwaukee show and some breeders suspected European fish were the cause. However the virus got here, ever since then our show guppies have been vulnerable, having little or no immunity and subject to 95% viral wipe-outs. Imports have since replaced domestically produced guppies in pet stores for the most part. There is an excellent article in the online IFGA library on fighting guppy disease by Stan Shubel. He handled his crisis admirably, his account of fighting guppy disease is a classic textbook case of the process of viral attenuation that is a virus grown under adverse conditions grows weaker and is rendered harmless or much less dangerous over time. He would have made virologists proud with how he handled it. Though it was unclear exactly what was causing it at the time, by treating the secondary infections and fighting to save his stock, he was in effect vaccinating his fish in the process. He doesn't specifically identify it as a virus, but only a virus can wreak the type of havoc he describes and then burn itself out and attenuate over a period of a few months. Attenuation is a classical method of production of vaccines against viruses and occasionally some bacteria. I had a similar experience to his with a viral wipe-out, (mine was from chain store Asian imports for sure) and I rebuilt my fish room from the survivors soon after re-entering the hobby a few years ago.

The hygiene hypothesis basically contends that people raised in too sterile of an environment are more susceptible to nagging illnesses. I believe wholeheartedly and speak from experience that this also applies to keeping guppies. One of the biggest hurdles the guppy hobby needs to clear today is that of loving them to death. Expensive trios that die when moved to a new environment with good water parameters before fry are dropped is, to me, totally unacceptable, as are fish that need constant medication to stay alive. A lot of eager first time hobbyists are lost forever after a bad experience with expensive fish. I was an experienced guppy keeper and was disgusted when I re-entered the hobby and found fish difficult to keep alive. Warning bells go off now for me when a breeder recommends elaborate preparations and attention to pH and hardness and medications, other than possible a bit of salt and worming/parasite medications for the arrival of a trio. Their directions might be meant to help a novice but they make me a bit nervous nonetheless. Let me say that as long as a breeder will stand by their fish and guarantee a drop of fry, I have no problem with them and would buy fish if needed without reservation. I also think a shift to sending fry packages versus trios would be of benefit to the hobby, as they acclimate easier. Guppies should be able to tolerate a wide range of PH and hardness and a fairly wide range of temperature conditions, from acidic backwater filled with tannins to even full saltwater, and from the 50s to the 90s in temperature for at least short periods. I have had my fish survive in both during the last year, I had some fish outside in barrels in dark tannic waters and I gave culls to a friend that acclimated them to saltwater over 24 hours to use as feeders. I rescued some stunned fish from a barrel after an early fall freeze that dropped the water temperature to the low 40's, they were dying and wouldn't have lasted long but recovered fully.

I think the root of the problem is that we are killing them with kindness, raising them in sparkling clean tanks with frequent or constant water changes. A return to simpler methods of guppy husbandry is needed. I think a change is also needed in how we select our breeders. I used to think that inbreeding over too long of a period was the main problem, but mine eyes have seen the glory, so to speak, and I have seen that for even the weakest inbred fish there is hope of recovery of vigour, hardiness, and deportment through selection and husbandry. I have brought strains back from the brink of extinction in my fish room and so have others. The problem really doesn't seem to be the inbreeding like I originally thought, but instead selecting the wrong breeders out of a population. If you breed the two wrong fish, there will always be problems. You can't improve and win with a strain you can't keep alive. Guppies need to be a pleasure to keep, not a burden. Vitality and deportment and favourable responses to stressful conditions need to be the, most important selection criteria if a strain is hard to keep. Perfection of conformation can be worked on conventionally once the fish are easier to keep healthy.

There is something in genetics called the "operon concept". We as hobbyists don't really need to understand the details, but the gist of it is that all animals have genes that can be activated or repressed by the environmental conditions they encounter. Some of these are obviously connected to the adaptive responses of the fish to stress and disease. There is a lag period sometimes, unfortunately, and some fish don't adapt quickly enough and die. Fish that can most easily adapt to stress should be kept as breeders, and those that cannot, should be culled. Common sense guppy breeders have followed this for a long time without any need to understand the reasons why it works, and there are still enough old breeders

out there that I have hope for the hobby. It appears the guppy is a good case in point for the concept of genes either being repressed or activated based upon what the guppy encounters in its environment. Fish raised in sterile environments do not have the ability to cope quickly enough with changes in their physiology to changes in their environment such as pH, hardness, temperature swings, parasites, protozoans, bacteria, fungi, etc. Their immune systems have never been challenged and they are vulnerable to all sorts of maladies. We need to make sure these dormant genes for fitness are expressed by challenging the fish and giving their immune systems some exposure to infusoria during their growth and development. I had such trouble getting fry to work with when I re-entered the guppy hobby a few years back that I crossed selected wild type males into fancy females to try to get some fish that would live. When I had much better luck at that point I chalked up the success to the wild genes for fitness that the males carried, and wasn't sure a toughening treatment would apply to inbred IFGA strains. Then I had a conversation that changed my mind and really made a few light bulbs go off in my head.

The good news is you can bring a problem strain back from the brink. Even the weakest of inbred strains can be saved if you can get a few fry to work with. A fellow hobbyist, Greg Dickman, got caught in the trap of a beautiful trio of high dollar fish with no viability. While gorgeous in conformation, the fish were a disaster as regards fitness

Criteria. Only one drop of fry was realized from the original trio after nearly 6 months of waiting, and these were not virgin females! The male's ability or lack thereof played no part in the lousy reproductive performance. Luckily, the 3 fry were 2 males and a female. Split tails and fin rot also plagued the original male's short life. It should be noted that new sterile equipment was used to receive the fish and all water parameters were followed to the letter. Shipment was in May, very mild conditions.

After receiving lots of one-word, one-sentence answers from many in the I.F.G.A., Greg was able to finally get some help from the Mousseaus, and Steve Rybiki of AngelsPlus.

This led Greg to examine his fish closer. Sure enough, the females were dropping small, underdeveloped fry. A breeding trap was employed to save a good drop from the lone female offspring. The irony is that the very device that caused the problem was initially employed to save the line. The line was producing extremely small fry that would lie on the bottom of the tank for up to 9 hours before attempting to swim. Not premature, no yolk sacs-just plain weak fish. There are not enough unravelled Chore Boy scrubbers in the World to save such "sitting ducks". The females were not so much cannibalistic as they were simply opportunists. It seems the line had theretofore been kept going artificially with the habitual use of breeding traps by an I.F.G.A. breeder hyper-focused on numbers. They were German Red Lace Snakeskins, and many who have had this line/strain have lost them.

Meanwhile, the original male was kept in as near sterile surroundings as possible, with additions of water-soluble vitamin B to feedings of live baby brine shrimp and doses of Melafix to attempt to treat his split tail and finrot. Nothing worked.

It is now 4 years later, and Greg's Red Lace Snakeskins are alive and well, having survived power outages, a range of temperatures from 49 to 105 degrees, viral infections, and

enough brushes with bacterial infections to warrant "combat" pay. Today they are a pleasure to keep. Colony breeding, once sufficient numbers were realized, has replaced breeding traps, and selection for conformation is done from the deserving population-fish that have survived from birth to maturity in a near natural environment.

Fish are kept incredibly overcrowded in ratios of up to 200 per 10 gallon, growing to very good size, shedding considerable doubt on the theories surrounding release of growth-inhibiting hormones in crowded conditions. One to two inches of mulm-a pretty reddish brown colour similar to iron-rich river sand-covers the bottoms of all tanks, with algae freely covering the back and sides of each aquarium. Chick brooder heat lamps in clamp fixtures supply light 24/7 and all necessary heat, subject to, of course, wide variations. Fry are raised in green water with liberal feedings of boiled egg yolk, live baby brine shrimp feedings having been left for those profiting from the current Depression. Many of these tanks have no aeration or filtration, this job being done by heavy algae growth. Water changes are done when a tank's biological filter crashes-very rare. New water is limited to capping off evaporation. In short, every rule of typical show guppy husbandry is broken with the result that finrot and split tails have not been seen in years. Greg's examples and mine that follow are extreme, but show how tough guppies can get over a few years if they are really challenged. Green water can support extremely high fish density as Greg has shown, but I recommend aeration and circulation and 24 hour lighting if highly crowded to prevent it from crashing. I toughened my guppies a bit differently than Greg, did but there were some similarities as you will see; we both used response to crowding as one of the selection criteria. Now I will tell you of my experiences in toughening mine over the past few years.

The best way to start a toughening process with a strain is with a new drop of fry. I keep up to several hundred fry in a 2.5 gallon tank for several weeks without changing the water, and they grow like weeds. The tank has a box filter with aragonite and floss in it. The tank is filled at least 50% by volume with hornwort. I like hornwort since it does well and grows very fast even under relatively weak lighting if you let it float. A cheap 4 foot shop light a few inches above a row of tanks is plenty to keep it going. If you are doing this for the first time, shake out the filter that is ready for cleaning and seed the tank with a few ounces of the dirty looking water. This will add filter bacteria and some infusoria to help jump start the immune systems of the fry. Snails or some water in which they have been kept can be added to help seed the tank with some infusoria. If the tank is kept under 24 hour lighting, with a lot of plants or green water, several hundred fry can be kept in a 2.5 gallon tank for several weeks without the water parameters going out of whack. When I feed, I push the plants aside, so there is a bare area of surface. I feed them de-capsulated brine shrimp and spirulina flake and they grow nicely despite the crowding. By the end of 3 weeks there might be a half inch of mulm and detritus on the bottom and the tank walls might have a lot of algae on them. I guess I am also selecting for fish that grow well despite crowding, though it didn't really hit me until I was writing this was selecting for fish that were able to tolerate crowding and stay healthy, I guess I got a two for one there. I dump the entire contents of the tank into a 29 gal and immediately remove all the males to their own tank. I scrub at least one or 2 sides of the 2.5 gallon tank with a diaper wipe and refill it for the next batch of fry. I do not try to get it sparkling clean. As for the 29 gal tank, I might keep up to 500, one month to 2 month old fish in it during the culling process. My 29 gal is in front of a sunny South window and is green water. Sometimes, I will do a water change just so I can see the

fish to cull and sort. I have to raise a lot more than I otherwise would and cull harder since my strains are still new. I usually let mulm and detritus build up on the bottom and there is usually floating hornwort in all of my tanks, it is temporarily removed to a bucket when I need to net fish. If green water gets thick, you might need to use a big net and get all the fish out and sort them in a clear tank. My fish are so fertile now that I usually just let them drop in the breeder tanks and let the fish do the first cull of any weak fry before I net the survivors and move them to a fry tank, and I still have too many fry. That is a problem I wish I had a few years ago. I scrape the front walls of my tanks with a credit card usually about once a month or when I have trouble seeing the fish. Usually the only time I have a sparkling clear tank is if I want to take some photos. My 10 gal tanks usually have up to about 20-40 adult size fish, and the fish do well and show no stress at those stocking densities under the conditions I keep them in.

I let temperatures fluctuate sometimes up to 10 degrees up or down from the tank water when I do water changes to see if any weaker fish get stressed. They get culled if any seem to not return to normal activity within a few minutes. Usually I do about 80-90% water changes about once a month to two months, or when I can't see the fish anymore. I leave at least a little crud on the bottom in my bare bottomed tanks. The water is typically tea coloured when I change it. If I have a bunch of breeders that look about equal, I will crowd and stress them until some show obvious signs of stress or get sick. The stressed or sick fish are the first culls. Sometimes a few fish would get sick with fungus and others would be totally unaffected without any treatment. Some males are much more susceptible to caudal erosion than others when crowded, which is also an easy culling choice. Once you get the numbers up a bit, it is obvious which fish to cull. As a general rule of thumb, if salt, methylene blue, or melafix can't cure a fish in a 5 gallon hospital bucket in a week, the fish are culled. As your fish get tougher over a few generations they will be a pleasure to keep once again. I use anti-protozoan and anti-worm flake food as needed if any fish show white stringy stools, but at this point those fish usually just get culled. One other thing I think that seems to help, especially in male grow out and holding tanks, is to keep a power head running, the fish build some muscle in their caudal peduncles so they can carry a large caudal fin. The toughening process can be gradual and I am giving a lot of detail so people can pick and choose what might work for them in their fish rooms. There is more than one way to go about the process as Greg has proved. I gradually let water go longer between changes, letting the interval go longer if the fish looked OK. Also raise some fish outdoors between April and October, roughly between last and first frost. I take a few fish outdoors and acclimate them over an hour in bags in 55 gal barrels in partial shade in Spring when water temps are in the 50's and then add a cow patty to each barrel to grow green water and daphnia for them. I just give them anti-protozoal and anti-worm flake food when I bring the best of them indoors in the fall, usually when the water temps are in the 50's. This is an additional and optional selection step for fitness that is hard to do indoors and I get a lot of extra gallons to raise fish in, most of which go to become feeders, only a few of the best come back indoors to the breeder tanks. My strains are relatively new so large numbers help, I have a lot of culling to do but they are still improving, I was told my fish made a good showing last year at the one show I took them to. Now that they are a pleasure to keep, I can spend the next few years fine tuning them, and the process will not be fraught with worry for their viability.

I suppose toughening fish to some useful degree can also be done in tanks with central filtration as well, I would just seed tanks with infusoria and a bit of mulm and detritus. If I had a water holding tank to draw water from, I would seed that by shaking a used filter into it. Some Asian breeders are keeping some tanks half bare, half gravel with some potted plants. The gravel provides a home for some infusoria to help challenge the immunity of the fish and the filter bacteria and plants there also provide a safety margin to keep water parameters acceptable for a while if the primary filters might fail.

Every Fish room is different, hopefully people will ask themselves if their fish are as tough as they would like them to be, and if not, take some small steps at first and add a few extra selection criteria for breeders. Maybe scrape only the front wall of your tanks as a start? There is more than one way to do it, Greg shared his account which was different from mine in some ways, similar in others, but also succeeded in producing easy to keep fish. Start with fry or young fish and over time, make fitness one of your selection criteria and your fish can be a lot tougher and pleasant to keep. You don't need to toughen them to an extreme, just enough to make them easy to keep without constant worry. Show males can always be treated to a sparkling tank when their caudals near full development if you have any problems with caudal erosion in older fish. Over time caudal erosion could become less of a problem if you make ability to resist it one of your selection criteria. I have a few males in a crowded holding tank that have been there for months with a half inch of crud on the bottom that have no caudal erosion. Some still get it to a degree, but guess which males will get a second chance with some young females in their old age? Toughening them should improve deportment, so you might gain a point in a competitive class. I saw improvement in health with the first generation raising fry the way I described, and the fish in my breeder tanks are improving in conformation, tolerate crowding better, and continue to have fewer and fewer health problems over time as I select for toughness.

I would also ask others to share their Fish room experiences and submit articles to the forum, exchange of ideas will help keep the hobby strong. (we don't always have to agree, but debate is healthy and if someone raises some good fish very differently that I do and participates and shows them ,I will still have respect for their skills and methods, and gain an appreciation that there is more than one way to raise a good guppy. I am sure this article will provoke a lot of healthy debate and self-examination. I didn't want to just complain about a problem without doing my best to help fix it. I hope breeders will consider Greg's and my examples and choose to consider whether they may relate to any problems they have encountered with strains that were difficult to keep alive. What are you waiting for? Show your guppies some tough love and keep your guppies and the hobby strong!

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